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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/588,256

11/22/2006

Harold J. Schreier

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INTELLECTUAL PROPERTY / TECHNOLOGY LAW

PO BOX 14329

RESEARCH TRIANGLE PARK, NC 27709

EXAMINER

PRINCE, FRED G

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

03/28/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/588,256	Applicant(s) SCHREIER ET AL.	
	Examiner FRED PRINCE	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-8 is/are allowed.
- 6) ☒ Claim(s) 9-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1106, 1106</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102/103

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 9-17 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Linden et al. (WO 03/065798).

Linden et al. teach a system comprising at least one aquatic species rearing tank (10), wherein the rearing tank comprises a salt water medium; a tank (2a) positioned downstream from the rearing tank and in fluid communication therewith, wherein the sludge holding tank comprises a media substrate (pg. 8, lines 6-7); a denitrification unit (2b) positioned downstream from the sludge tank and rearing tank and in fluid communication therewith, wherein the denitrification unit comprises a media substrate (pg. 8, lines 6-7) for nitrate reduction; and a nitrifying moving bed bioreactor (5a,5b,5c) positioned downstream from the denitrification unit and upstream of the rearing tank and in fluid communication therewith, wherein the nitrifying moving bed bioreactor comprises

a media substrate for growth of microorganisms active in nitrification, a drum screen (3;pg. 8, pg. 25) between the rearing tank and sludge tank.

Regarding the limitation that the tank is a sludge holding tank and the media is for growth of microorganisms active in sulfate reduction and the denitrification tank having the media for growth of anaerobic microorganisms active in sulfide oxidization, it is submitted that the recitations are ones of intended use that fail to add structure to the apparatus. If it is applicant's position that the limitations somehow add structure to the claims it is submitted that the tanks is capable of holding sludge and microorganisms active in sulfate reduction and the denitrification tank having the media for growth of anaerobic microorganisms active in sulfide oxidization.

Per claim 11, Linden et al. do not explicitly teach an aerator to inject air or oxygen nitrification.

It is submitted that it is conventional in the art to provide an aerator to inject air or oxygen nitrification in order to, for example, ensure that adequate levels of oxygen exist in the in the nitrification zone.

Per claim 12, it is well within the purview of the skilled artisan to provide a media substrate comprising polyethylene beads in order to, for example, utilize a low density material capable of having biomass formed thereon (see, for example, US Pat No 5,232,586 to Malone).

4. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Linden et al. ('798).

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Linden et al. disclose a method comprising the steps of rearing an aquatic species in a rearing zone (10) containing salt water medium comprising sulfates, ammonia and nitrates; filtering (3) the salt water medium from the rearing zone to separate solids from the salt water medium and yield a filtered salt water medium; oxidizing sulfides in the sulfide-containing salt water medium to sulfates (pg. 19) and reducing nitrates in the sulfide-containing salt water medium to nitrogen gas, by action of anaerobic microorganisms adapted therefor, to yield a denitrified saltwater medium; reducing ammonia in the denitrified (5a,5b,5c) salt water medium, by action of aerobic microorganisms adapted therefore, to yield an ammonia-reduced salt water medium; and recycling the ammonia-reduced salt water medium to the rearing zone, wherein the at least one microorganism from each of the recited groups (pp. 19-20) is provided.

Linden et al. do not explicitly disclose reducing sulfate in the filtered salt water medium to sulfide by action of anaerobic microorganisms adapted for sulfate reduction, to yield sulfide-containing salt water medium.

It is submitted that it would have been readily obvious for the skilled artisan to modify the method of Linden et al. such that it includes reducing the sulfates in an anaerobic zone to produce sulfides in order to, for example, facilitate removal of sulfates from the water in the form of biogas, as routine in the art.

Allowable Subject Matter

5. Claims 1-8 are allowed.

While it is known in the art to provide a method including the steps of housing an aquatic species in a rearing tank containing salt water medium, wherein the

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salt water medium comprises sulfates and is contaminated with at least ammonia and nitrates; transferring the salt water medium from the rearing tank through a downstream filter for separating solid materials from the salt water medium; wherein the sludge holding tank comprises a media substrate for growth of anaerobic microorganisms active in sulfate reduction; retaining the separated sludge and salt water medium in the sludge holding tank a sufficient time for generating sulfides through metabolic reduction of sulfate in the salt water medium by the anaerobic microorganisms active in sulfate reduction; transferring the salt water medium comprising the sulfides from the sludge holding tank to a denitrification unit positioned downstream from the sludge tank, wherein the denitrification unit comprises a fixed bed of media substrate for growth of anaerobic microorganisms active in sulfide oxidization and nitrate reduction; retaining the salt water medium in the denitrification unit for a sufficient time for oxidizing sulfides to sulfates and reducing nitrates to nitrogen gas by the microorganisms active in sulfide oxidization and nitrate reduction; transferring the salt water medium from the denitrification unit to a nitrifying moving bed bioreactor (MBB) positioned downstream from the denitrification unit, wherein the MBB comprises moving suspended media substrate for growth of aerobic microorganisms active in nitrification; retaining the salt water medium in the MBB for a sufficient time to reduce ammonia concentration in the salt water medium; and transferring the salt water medium from the MBB to the rearing tank for recirculation (see, for example, WO 03/065798 to Linden et al.), in the examiner's opinion, the prior art fails to teach or fairly suggest transferring separated solids and at least some of the salt water medium to the sludge holding tank.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FRED PRINCE whose telephone number is (571)272-1165. The examiner can normally be reached on Monday-Thursday, 6:30-4:00; alt. Fridays 6:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Fred Prince/
Primary Examiner, Art Unit 1797

fgp
3/26/08